^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ) 1982Ro08

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 90, 431 (2000)	5-Jul-2000

Other: 1977Ri13.

1982Ro08: ^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ); E(^{17}O)=80 MeV, E(^{18}O)=84 MeV; 9 angles used; metallic Sm targets enriched to>98% in ^{154}Sm; measured Eγ, Iγ (Ge(Li), Compton-suppressed Ge(Li), large-volume NaI), $\gamma\gamma$ coin, $\gamma(\theta)$.

The level scheme is from 1982Ro08.

^{167}Yb Levels

E(level)	J$^\pi$[†]	E(level)	J$^\pi$[†]	E(level)	J$^\pi$[†]	E(level)	J$^\pi$[†]
0.0[‡]	5/2$^-$	407.9[@] *3*	17/2$^+$	1601.3[@] *4*	29/2$^+$	3398.7[#] *5*	41/2$^+$
29.66[#] *1*	5/2$^+$	442.4[‡] *3*	13/2$^-$	1656.6[‡] *4*	25/2$^-$	3532[@]	39/2$^+$
33.91[@] *2*	7/2$^+$	644.4[#] *3*	19/2$^+$	2148.3[#] *4*	33/2$^+$	3837[‡]	41/2$^-$
58.54[#] *2*	9/2$^+$	721.4[@] *3*	21/2$^+$	2158.4[‡] *4*	29/2$^-$	4091.0[#] *7*	45/2$^+$
78.6[‡] *7*	7/2$^-$	783.6[‡] *4*	17/2$^-$	2158.6[@] *4*	31/2$^+$	4292[@]	43/2$^+$
125.9[@] *3*	11/2$^+$	1060.8[#] *3*	23/2$^+$	2683.7[‡] *5*	33/2$^-$	4497[‡]	45/2$^-$
178.8[‡] *3*	9/2$^-$	1121.9[@] *3*	25/2$^+$	2751.1[#] *5*	37/2$^+$	4833[#]	49/2$^+$
186.0[#] *2*	13/2$^+$	1192.7[‡] *4*	21/2$^-$	2817[@]	35/2$^+$	5213[‡]	49/2$^-$
330.2[#] *3*	15/2$^+$	1569.7[#] *3*	27/2$^+$	3237[‡]	37/2$^-$	5634[#]	53/2$^+$

[†] From 1982Ro08; based on multipolarities of transitions and fits of cascades of coincident γ rays into expected rotational bands.
[‡] Band(A): 5/2[523] band member.
[#] Band(B): 5/2[642], α=+1/2.
[@] Band(b): 5/2[642], α=−1/2.

γ(^{167}Yb)

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	Comments
(24.63[@] *1*)		58.54	9/2$^+$	33.91	7/2$^+$		
(28.88[@] *2*)		58.54	9/2$^+$	29.66	5/2$^+$		
29.66[@] *1*		29.66	5/2$^+$	0.0	5/2$^-$		
33.91[@] *2*		33.91	7/2$^+$	0.0	5/2$^-$		
60.1 *2*	360[c] *36*	186.0	13/2$^+$	125.9	11/2$^+$	[M1]	
61.1		1121.9	25/2$^+$	1060.8	23/2$^+$		
67.4		125.9	11/2$^+$	58.54	9/2$^+$		
76.9		721.4	21/2$^+$	644.4	19/2$^+$		
77.7 *5*	150[&] *30*	407.9	17/2$^+$	330.2	15/2$^+$		
78.6		78.6	7/2$^-$	0.0	5/2$^-$		
91.9		125.9	11/2$^+$	33.91	7/2$^+$		
100.1		178.8	9/2$^-$	78.6	7/2$^-$		
120.2 *5*	55 *11*	178.8	9/2$^-$	58.54	9/2$^+$		Mult.: A$_2$=+0.04 *17*, A$_4$=−0.09 *19* (1982Ro08).
127.5 *2*	413 *41*	186.0	13/2$^+$	58.54	9/2$^+$	Q	Mult.: A$_2$=+0.25 *3*, A$_4$=−0.06 *3* (1982Ro08).
144.2 *2*	458 *46*	330.2	15/2$^+$	186.0	13/2$^+$	D+Q	Mult.: A$_2$=−0.78 *3*, A$_4$=+0.14 *7* (1982Ro08).
144.9 *5*	80[&] *16*	178.8	9/2$^-$	33.91	7/2$^+$		
178.7 *5*	78 *16*	178.8	9/2$^-$	0.0	5/2$^-$	(Q)	Mult.: A$_2$=+0.09 *6*, A$_4$=−0.01 *7* (1982Ro08).
204.4 *2*	760 *76*	330.2	15/2$^+$	125.9	11/2$^+$	Q	Mult.: A$_2$=+0.27 *3*, A$_4$=−0.05 *4* (1982Ro08).
221.9 *2*	1000	407.9	17/2$^+$	186.0	13/2$^+$	Q	Mult.: A$_2$=+0.28 *3*, A$_4$=−0.06 *4* (1982Ro08).
236.5 *2*	286 *29*	644.4	19/2$^+$	407.9	17/2$^+$	D+Q	Mult.: A$_2$=−0.72 *3*, A$_4$=−0.01 *3* (1982Ro08).

Continued on next page (footnotes at end of table)

^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ) 1982Ro08 (continued)

γ(^{167}Yb) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
263.5 *5*	152 *30*	442.4	13/2$^-$	178.8	9/2$^-$	Q	Mult.: A_2=+0.21 *2*, A_4=−0.03 *2* (1982Ro08).
313.5 *2*	1.76×10^3 *18*	721.4	21/2$^+$	407.9	17/2$^+$	Q	Mult.: A_2=+0.47 *16*, A_4=−0.18 *16* (1982Ro08).
314.2 *2*	533 *53*	644.4	19/2$^+$	330.2	15/2$^+$	(Q)	Mult.: A_2=+0.23 *11*, A_4=−0.13 *12* (1982Ro08).
316.6 *5*	147[a] *30*	442.4	13/2$^-$	125.9	11/2$^+$		Mult.: A_2=+0.41 *5*, A_4=+0.10 *5* (1982Ro08).
339.4 *5*	130 *26*	1060.8	23/2$^+$	721.4	21/2$^+$	D+Q	Mult.: A_2=−0.65 *3*, A_4=−0.08 *4* (1982Ro08).
341.2 *2*	232 *23*	783.6	17/2$^-$	442.4	13/2$^-$	Q	Mult.: A_2=+0.26 *2*, A_4=−0.09 *2* (1982Ro08).
400.5 *2*	1.52×10^3 *15*	1121.9	25/2$^+$	721.4	21/2$^+$	Q	Mult.: A_2=+0.28 *4*, A_4=−0.07 *5* (1982Ro08).
409.1 *2*	330 *33*	1192.7	21/2$^-$	783.6	17/2$^-$	Q	Mult.: A_2=+0.33 *3*, A_4=−0.06 *3* (1982Ro08).
416.4 *2*	616 *62*	1060.8	23/2$^+$	644.4	19/2$^+$	Q	Mult.: A_2=+0.24 *3*, A_4=−0.04 *3* (1982Ro08).
447.8 *5*	73 *15*	1569.7	27/2$^+$	1121.9	25/2$^+$	D+Q	Mult.: A_2=−0.52 *5*, A_4=+0.13 *6* (1982Ro08).
453	120[&] *24*	783.6	17/2$^-$	330.2	15/2$^+$		
463.9 *2*	343 *34*	1656.6	25/2$^-$	1192.7	21/2$^-$	Q	Mult.: A_2=+0.25 *3*, A_4=−0.03 *4* (1982Ro08).
479.4 *2*	1.28×10^3 *13*	1601.3	29/2$^+$	1121.9	25/2$^+$	Q	Mult.: A_2=+0.26 *4*, A_4=−0.06 *4* (1982Ro08).
501.8 *2*	331 *33*	2158.4	29/2$^-$	1656.6	25/2$^-$	Q	Mult.: A_2=+0.22 *2*, A_4=−0.10 *3* (1982Ro08).
508.9 *2*	660 *66*	1569.7	27/2$^+$	1060.8	23/2$^+$	Q	Mult.: A_2=+0.20 *3*, A_4=−0.05 *4* (1982Ro08).
525	[b]	2683.7	33/2$^-$	2158.6	31/2$^+$		
525.3 *2*	344 *34*	2683.7	33/2$^-$	2158.4	29/2$^-$	Q	Mult.: A_2=+0.18 *3*, A_4=−0.07 *3* (1982Ro08).
547.0 *2*	1.03×10^3 *10*	2148.3	33/2$^+$	1601.3	29/2$^+$	Q	Mult.: A_2=+0.26 *5*, A_4=−0.08 *5* (1982Ro08).
548	40[&] *8*	1192.7	21/2$^-$	644.4	19/2$^+$		
553	524[a] *52*	3237	37/2$^-$	2683.7	33/2$^-$	Q	Mult.: A_2=+0.48 *7*, A_4=−0.19 *7* (1982Ro08).
557.4 *5*	[b]	2158.6	31/2$^+$	1601.3	29/2$^+$		
588.9 *2*	425[a] *43*	2158.6	31/2$^+$	1569.7	27/2$^+$	Q	Mult.: A_2=+0.17 *2*, A_4=−0.02 *2* (1982Ro08).
589	[b]	2158.4	29/2$^-$	1569.7	27/2$^+$		
596	[b]	1656.6	25/2$^-$	1060.8	23/2$^+$		
600	227 *23*	3837	41/2$^-$	3237	37/2$^-$	Q	Mult.: A_2=+0.22 *6*, A_4=−0.07 *7* (1982Ro08).
602.8 *2*	775[a] *78*	2751.1	37/2$^+$	2148.3	33/2$^+$	Q	Mult.: A_2=+0.19 *2*, A_4=−0.05 *3* (1982Ro08).
647.6 *2*	340[a] *34*	3398.7	41/2$^+$	2751.1	37/2$^+$		Mult.: A_2=+0.08 *2*, A_4=+0.06 *3* (1982Ro08).
658	240 *24*	2817	35/2$^+$	2158.6	31/2$^+$		Mult.: A_2=+0.13 *4*, A_4=+0.06 *5* (1982Ro08).
660	[b]	4497	45/2$^-$	3837	41/2$^-$		
692.3 *5*	[d]	4091.0	45/2$^+$	3398.7	41/2$^+$		
715	[b]	3532	39/2$^+$	2817	35/2$^+$		
716	[b]	5213	49/2$^-$	4497	45/2$^-$		
742		4833	49/2$^+$	4091.0	45/2$^+$		
[x]760	[b]						
760		4292	43/2$^+$	3532	39/2$^+$		
801		5634	53/2$^+$	4833	49/2$^+$		

[†] From 1982Ro08; uncertainties are <0.2 keV for Iγ≥200, 0.5 keV for weaker gammas.

[‡] Arbitrary units relative to Iγ=1000 for 221.9γ. Values are from the average of the 30° and 90° projected spectra for ^{154}Sm(^{18}O,5nγ) at 84 MeV (1982Ro08). Uncertainties are 10% for Iγ≥200, up to 20% for weaker gammas.

[#] From $\gamma(\theta)$ in ^{154}Sm(^{18}O,5nγ) (1982Ro08). Authors interpret stretched Q transitions as E2, D+Q transitions as M1+E2.

[@] From adopted gammas.

[&] From coincidence data; not corrected for possible angular correlation effects.

[a] Includes contribution from contaminant lines.

[b] Weak.

[c] Obtained by 1982Ro08 from intensity balance at 186 level, apparently under the assumption that the 60γ is pure M1 (were it E2, the evaluator estimates Iγ≥49 based on Ti(60γ)≥1170 *180* and α(E2)=24.8).

[d] Intensity measurement not possible in 1982Ro08 (background interference).

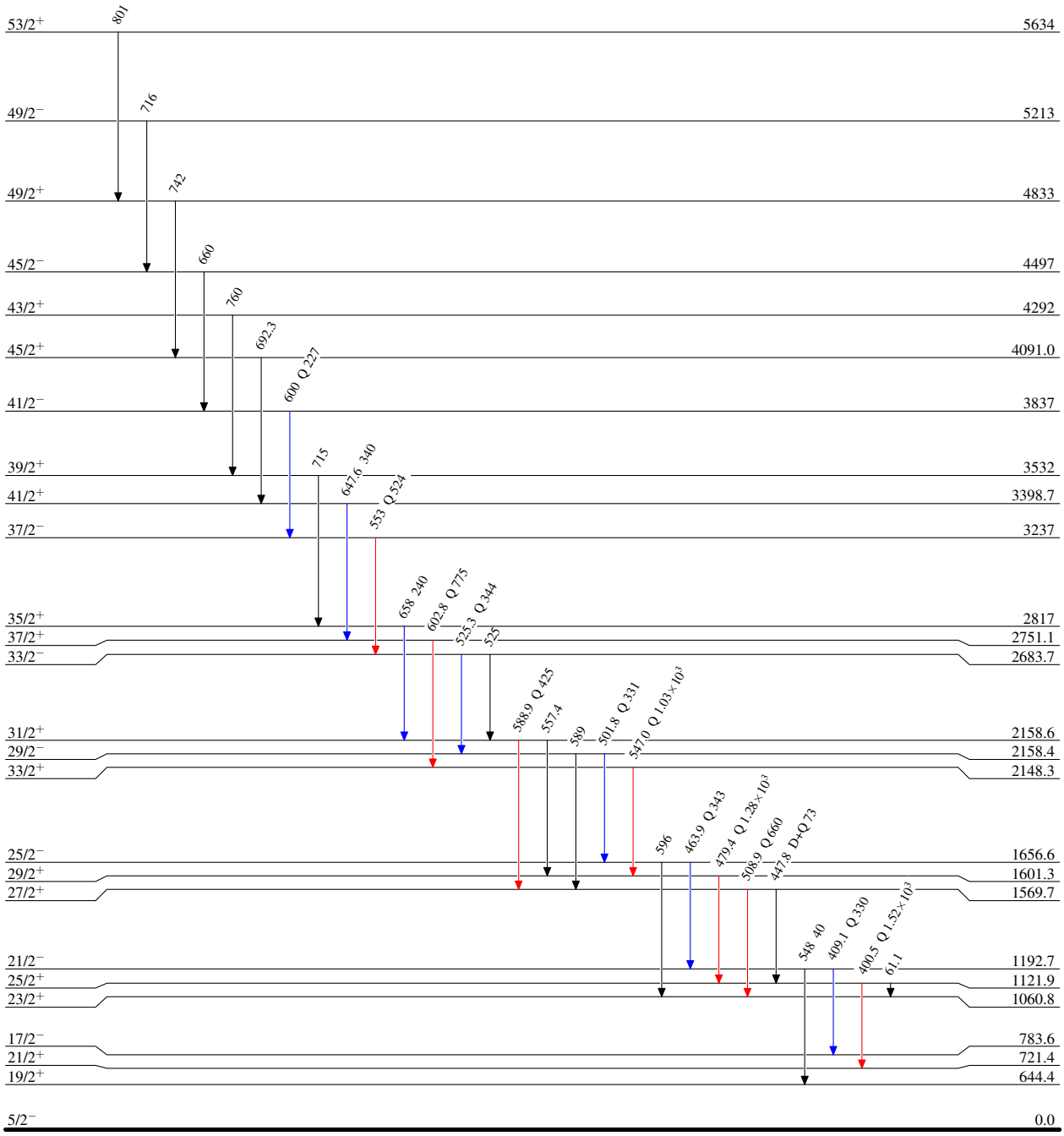
[x] γ ray not placed in level scheme.

^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ) 1982Ro08

Level Scheme

Intensities: Relative Iγ from (^{18}O,5nγ) At E=84 MeV

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



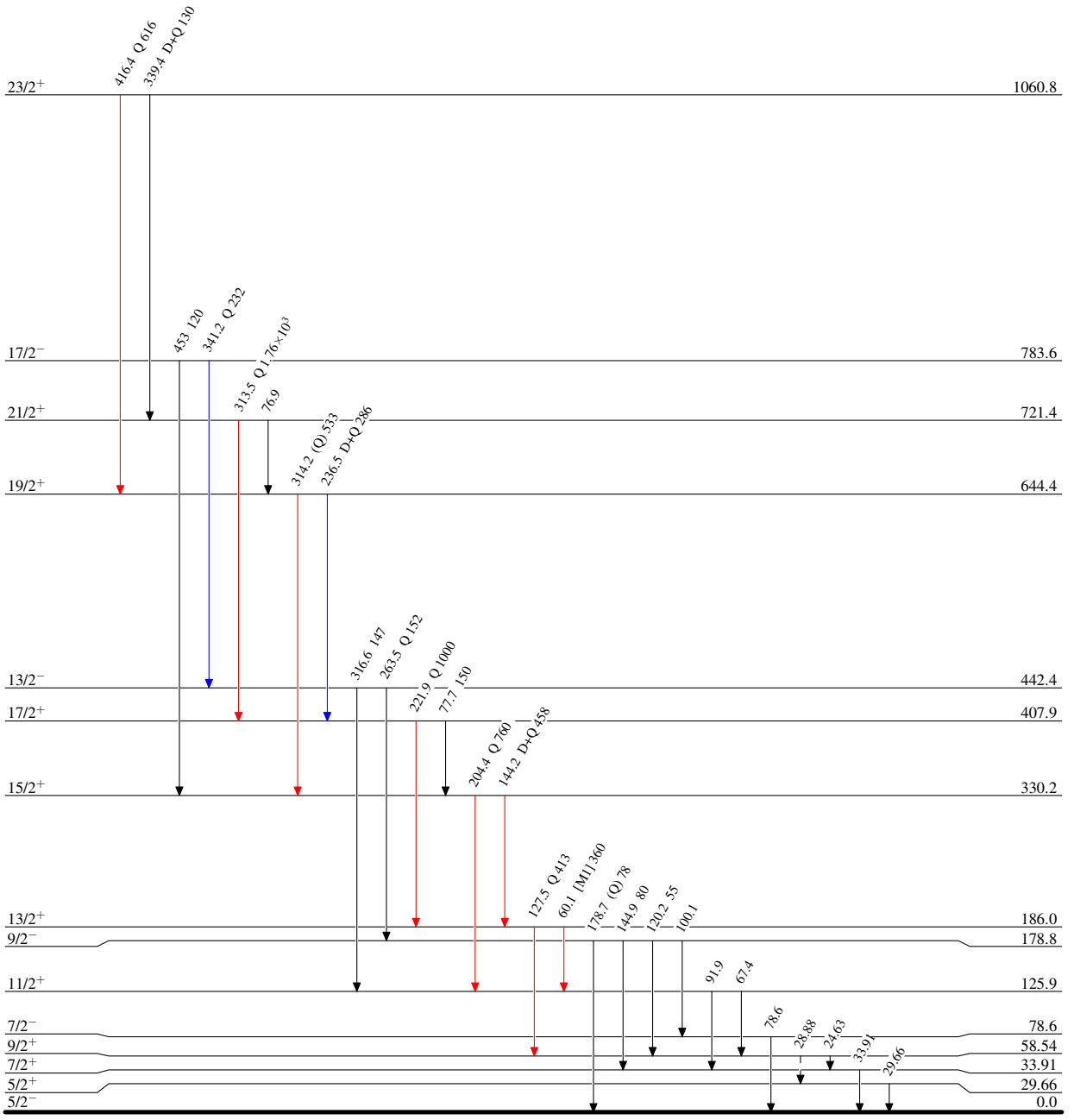
$^{167}_{70}Yb_{97}$

^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ) 1982Ro08

Level Scheme (continued)

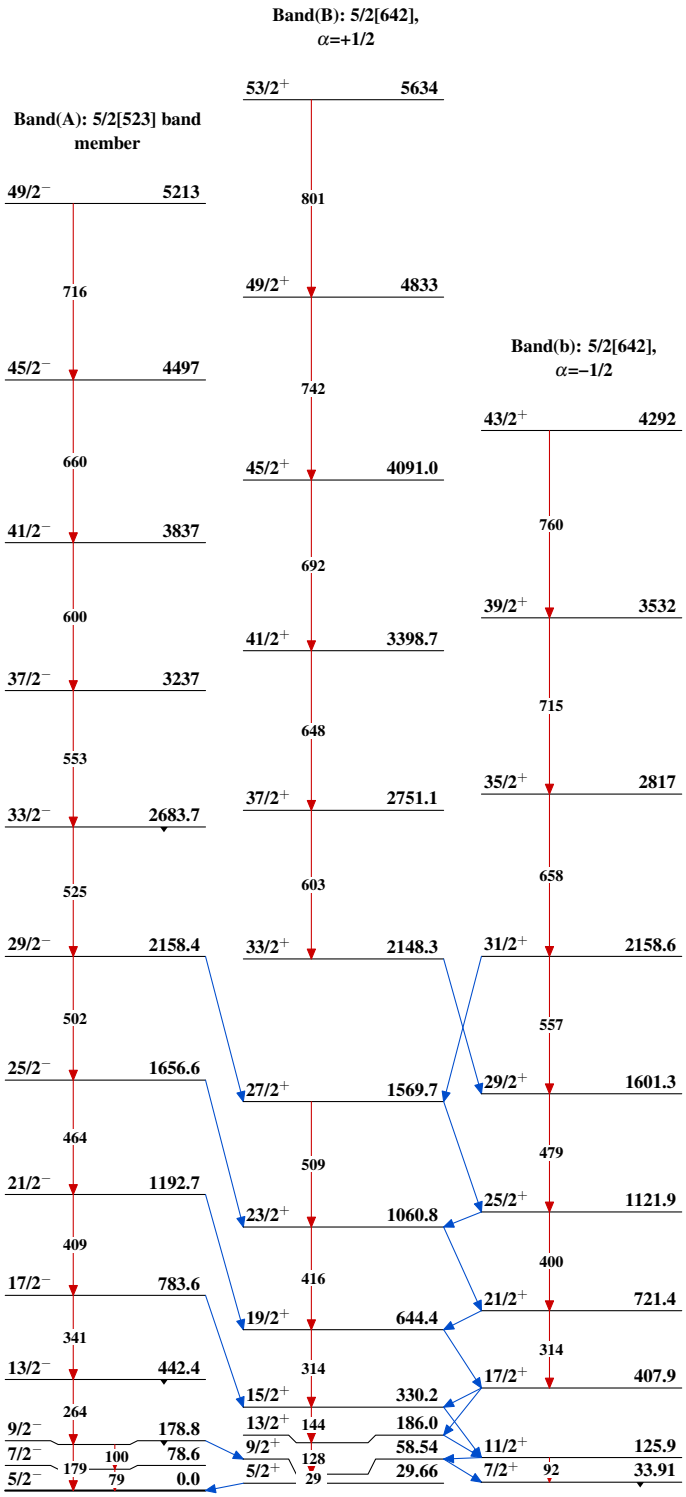
Intensities: Relative Iγ from (^{18}O,5nγ) At E=84 MeV

Legend
- Iγ < 2%×Iγ^{max}
- Iγ < 10%×Iγ^{max}
- Iγ > 10%×Iγ^{max}
- γ Decay (Uncertain)



$^{167}_{70}Yb_{97}$

^{154}Sm(^{17}O,4nγ), ^{154}Sm(^{18}O,5nγ) 1982Ro08



$^{167}_{70}Yb_{97}$